Space Weather Forecast

Issued on Tuesday, 14 March 2023 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Geomagnetic storms due to possible glancing coronal mass ejections day 2 (15th). S1/Minor Radiation storm from far-sided eruption continuing at times.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only isolated Common-class flares observed. There are ten sunspot regions currently on the Earth-facing disc. These are a mixture of small, mature spots with a few small but emergent/developing regions. Some slight growth has been observed in the yet unnumbered regions, though no single spot appears show any significant growth or magnetic attributes.

No sig CME's have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been indicative of a glancing transient or weak coronal hole fast wind arrival, with speed increasing from background to slightly elevated levels, starting around 14/0400 UTC. The total IMF strength was weak to moderate with a notable increase around 14/0350 UTC. The north-south component was mainly positive, before becoming more variable from around 14/0300 UTC. The Phi angle was mostly positive (away from the Sun) until 14/0945 UTC when it became negative (towards the Sun). Geomagnetic activity was Quiet to Unsettled (Kp 0-3) with one Active period (Kp 4) between 0300-0600 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been at elevated levels and sometimes above the S1/Minor Storm threshold in response to the large far sided CME from 13th.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is generally expected to be Low or Very Low, with isolated Common-class flares.

Solar Wind / Geomagnetic Activity: Glancing coronal mass ejection impacts are possible 14 March and through 15 March, due to three filament eruptions that occurred 10-13 March. These are all low confidence, however any combined effect could give a larger geomagnetic response than normally expected from such glancing impacts. Otherwise, an average of slightly elevated solar winds expected through much of the period, with a chance of becoming elevated due to the fast winds from coronal hole 84 early in the period. Quiet to Unsettled geomagnetic activity is expected, with possible Active intervals. The arrival of any coronal mass ejections will likely bring Active intervals with a chance of G1 Minor Storm intervals from late 14 March until 16 March, before easing to mainly Quiet by 17 March.

Energetic Particles / Solar Radiation: The count rate of energetic particles is currently at S1/Minor storm levels but is expected to gradually decline back to background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	40	30	1
Strong	G3	No	1	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	100	10	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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